

Supplementary Material

Table S1. Quality assessment of the included studies.

No	Included paper	Methodological items for rating (1–4)*									Total score
		Abstract & title	Introduction and aims	Method and data	Sampling	Data analysis	Ethics and bias	Results	Transferability (generalizable)	Implications and usefulness	
1	Wang et al., 2022	4	4	3	4	3	4	3	3	3	31
2	Sinuraya et al., 2022	3	3	3	2	3	2	3	2	3	24
3	Powelson et al., 2022	4	4	2	2	3	3	3	2	3	26
4	Özer et al., 2022	4	4	3	3	3	3	3	3	3	29
5	Olagoke et al., 2022	3	3	3	2	3	2	3	2	3	24
6	Hill et al., 2022	3	2	3	2	3	2	3	2	3	23
7	He et al., 2022	4	4	3	2	3	2	3	2	3	26
8	Gjini et al., 2022	3	3	3	3	3	3	3	3	3	27
9	Du et al., 2022	4	4	3	4	3	4	3	3	3	31
10	Çağ et al., 2022	3	3	3	4	2	3	2	3	2	25
11	Zhou et al., 2021	3	3	3	3	3	3	3	3	3	27
12	Seiler et al., 2021	3	3	3	3	3	3	3	3	2	26
13	Salawati et al., 2021	4	4	3	4	3	4	3	3	3	31
14	Hou et al., 2021	4	4	3	4	3	4	3	3	3	31
15	Goldman et al., 2021	3	3	3	4	3	3	3	3	3	28
16	Beatty & Villwock, 2021	3	2	3	2	2	2	2	2	2	20
17	Baghdadi et al., 2021	3	3	3	3	2	3	2	3	2	24
18	Al-Nafeesah et al., 2021	3	2	3	4	2	2	2	3	2	23
19	Aldakhil et al., 2021	3	3	3	2	3	2	3	2	3	24
20	Sokol & Grummon, 2020	3	3	3	4	3	4	3	3	2	28

* We used the tool developed by Hawker et al to assess quality of the studies. The tool covers nine domains: 1) abstract and title (did they provide a clear description of the study), 2) introduction and aims (was there a good background and clear statement of the aims of the research), 3) method and data (is the method appropriate and clearly explained), 4) sampling (was the sampling strategy appropriate to address the aims), 5) data analysis (was the description of the data analysis sufficiently rigorous), 6) ethics and bias (how ethical issues been addressed, and what has necessary ethical approval gained? Has the relationship between researchers and participants been adequately considered), 7) results (is these a clear statement of the findings), 8) transferability and generalizability (are the findings of this study transferable/generalizable to a wider population), and 9) implications and usefulness (how important are these findings to policy and practice). These domains are rated from 1=very poor, 2=poor, 3=fair, to 4=good. Criteria of ratings followed the statements listed in Appendix D (p. 1296-1297) of Hawker, S., Payne, S., Kerr, C., Hardey, M., & Powell, J. (2002). Appraising the evidence: Reviewing disparate data systematically. *Qualitative Health Research*, 12(9), 1284-1299. doi:10.1177/1049732302238251.

Table S2. Categories and associated factors of parental willingness to vaccinate their children.

N o	Ref	Associated Factors of Parental Willingness to vaccinate their children															Level of analysis
		Older children	Higher education level	Health care workers	Regional differences	Confidenc e in vaccines	Concern s about side effects	Increase d number of Children	Higher income	Influenz a history of Children	Influenz a history of parents	Childre n with chronic and or other diseases	Trust in health care informatio n Source	History of COVID- 19 infectio n in family	COVID-19 vaccine uptake/intentio n among parents		
Childhood/routine vaccination																	
1	Sinuraya et al., 2022	-	↑	↑	-	↑	-	-	-	-	-	-	-	-	-	-	Multivariabl e
2	Baghdadi et al., 2021	-	-	-	-	-	-	-	-	-	-	-	↑	-	-	-	Multivariabl e
3	Nafeesah et al., 2021	-	-	-	living in Riyadh or the Western regions↓	↑	-	↓	-	-	-	-	-	-	-	-	Multivariabl e
4	Aldakhil et al., 2021	-	↑	-	-	↑	↓	-	-	-	-	-	↑	-	-	-	Multivariabl e
5.	Wang et al., 2022								NA								
6.	He et al., 2022								NA								
7.	Gjini et al., 2022								NA								
8.	Çağ et al., 2022								NA								
Influenza vaccination																	
9.	Özer et al., 2022	-	-	-	-	-	-	-	-	-		↑	-	↑	-	-	Multivariabl e
10.	Hill et al., 2022	-	-	-	-	-	-	-	-	↑	-	-	-	-		↑	Multivariabl e
11.	Zhou et al., 2021								NA								
12.	Seiler et al., 2021	-	-		Latin Switzerland↑German Switzerland ↓	-	-	-	-	-	-	↑	-	-	-	-	Multivariabl e
13.	Salawati et al., 2021	-	↑	↑	-	-	-	-	↑	↑	-	↑	↑	-		↑	Multivariabl e
14.	Hou et al., 2021	↓	↑	-	-	-	-	-	-	-	-	-	-	-	-	-	Multivariabl e
15.	Goldman et al., 2021	-	↑	-	-	-	-	-	-	↑	↑	↑	-	-	-	-	Multivariabl e

Associated Factors of Parental Willingness to vaccinate their children																
No	Ref	Older children	Higher education level	Health care workers	Regional differences	Confidence in vaccines	Concerns about side effects	Increased number of Children	Higher income	Influenza history of Children	Influenza history of parents	Children with chronic and other diseases	Trust in health care information Source	History of COVID-19 infection in family	COVID-19 vaccine uptake/intention among parents	Level of analysis
16.	Du et al., 2022								NA							
17	Beatty & Villwock, 2021								NA							
18	Sokol & Grummon, 2020								NA							
Human papillomaviruses (HPV) vaccination																
19	Olagoke et al., 2022								NA							
Pneumococcal conjugate vaccination (PCV)																
20	Powelson et al., 2022								NA							
	Positive association ^a	0/1	5/5	2/2	1/3	3/3	0/1	0/1	1/1	3/3	1/1	4/4	3/3	1/1	2/2	
	Negative association ^b	1/1	0/5	0/2	2/3	0/3	1/1	1/1	0/1	0/3	0/1	0/4	0/3	0/1	0/2	

↑ more likely to vaccinate. ↓ less likely to vaccinate. - not investigated. NA not applicable. ^a Number of studies with a positive significant association (p-value < 0.05) between the predictor and parents' willingness to vaccinate their children/total number of studies examined the predictor. ^b Number of studies with a negative significant association (p-value < 0.05) between the predictor and parents' willingness to vaccinate their children/total number of studies examined the predictor.

Table S3. Categories and associated factors of parental hesitancy to vaccinate their children.

		Associated Factors of Parental hesitancy to vaccinate their children														
No	Ref	Older parents	Higher education level	Fathers	Ethnicity	Low Confidence in vaccines	Concerns about side effects	Lower health status of parents	Higher income	Health care workers	Influenza history of parents	Children with chronic and or other diseases	Low trust in health care information Source	COVID-19 vaccine uptake/intention among parents	Level of analysis	
Childhood/routine vaccination																
1	Wang et al., 2022	-	-	↑	-	-	-	↓	-	-	-	-	-	-	Multivariable	
2	He et al., 2022	↓	↓	-	Hispanic ethnicity and other multiple race↑	-	-	-	↓	-	-	-	-	-	Multivariable	
3	Gjini et al., 2022	-	-	-		-	↑	-	-	-	-	-	-	↑	-	Univariable
4	Aldakhil et al., 2021	-	↑	-		-	↑	↑	-	-	-	-	-	↑	-	Multivariable
5.	Çağ et al., 2022	-	↑	-		-	-	-	-	-	↓	↓	-	↑	↓	Multivariable
6.	Sinuraya et al., 2022								NA							
7.	Baghdadi et al., 2021								NA							
8.	Nafeesah et al., 2021								NA							
Influenza vaccination																
9.	Du et al., 2022	-	-	-	-	↑	-	-	-	-		↓	-	-	Multivariable	
10.	Zhou et al., 2021								NA							
11.	Özer et al., 2022								NA							
12.	Hill et al., 2022								NA							
13.	Seiler et al., 2021								NA							
14.	Salawati et al., 2021								NA							

Associated Factors of Parental hesitancy to vaccinate their children															
No	Ref	Older parents	Higher education level	Fathers	Ethnicity	Low Confidence in vaccines	Concerns about side effects	Lower health status of parents	Higher income	Health care workers	Influenza history of parents	Children with chronic and or other diseases	Low trust in health care information Source	COVID-19 vaccine uptake/intention among parents	Level of analysis
15.	Hou et al., 2021								NA						
16.	Goldman et al., 2021								NA						
17.	Beatty & Villwock, 2021								NA						
18.	Sokol & Grummon, 2020								NA						
Human papillomaviruses (HPV) vaccination															
19.	Olagoke et al., 2022								NA						
Pneumococcal conjugate vaccination (PCV)															
20.	Powelson et al., 2022								NA						
	Positive association ^a	0/1	2/3	1/1	1/1	3/3	1/1	0/1	0/1	0/1	0/1	0/1	3/3	0/1	
	Negative association ^b	1/1	1/3	0/1	0/1	0/3	0/1	1/1	1/1	1/1	1/1	1/1	0/3	1/1	

↑ more likely to vaccinate. ↓ less likely to vaccinate. - not investigated. NA not applicable. ^aNumber of studies with a positive significant association (p-value < 0.05) between the predictor and parents' willingness to vaccinate their children/total number of studies examined the predictor. ^b Number of studies with a negative significant association (p-value < 0.05) between the predictor and parents' willingness to vaccinate their children/total number of studies examined the predictor.

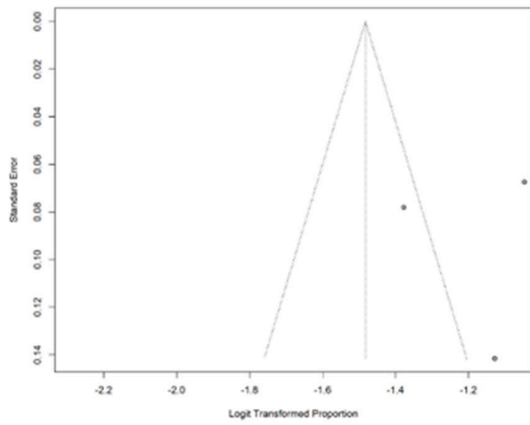
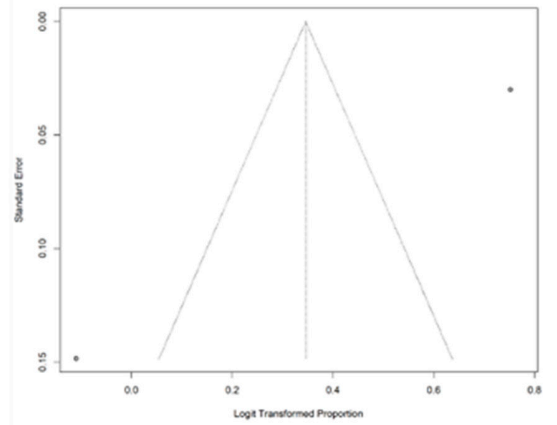
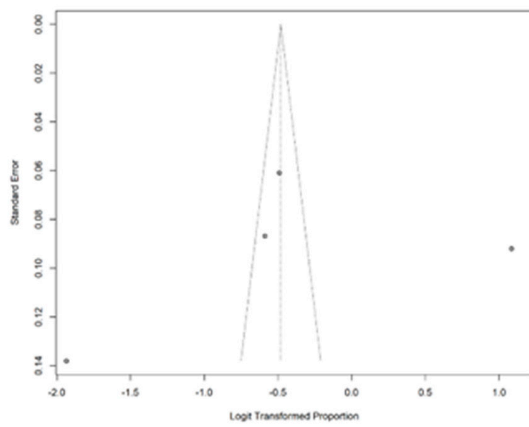
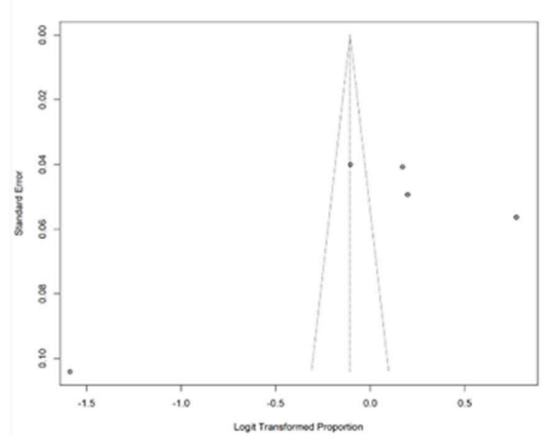
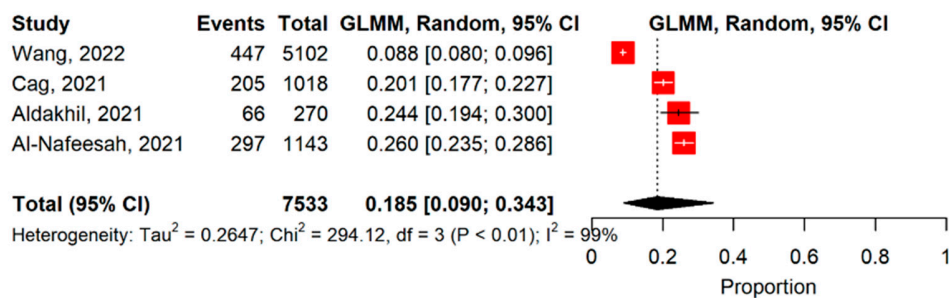
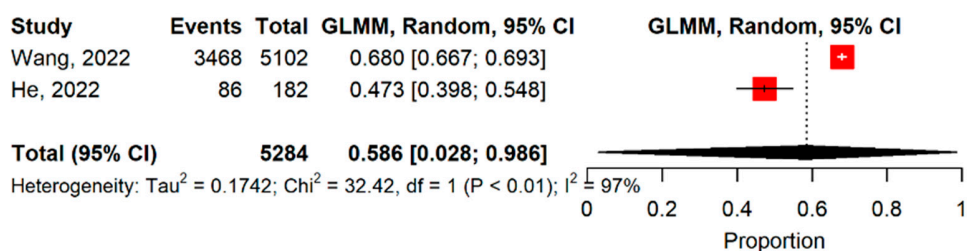
a.**b.****c.****d.**

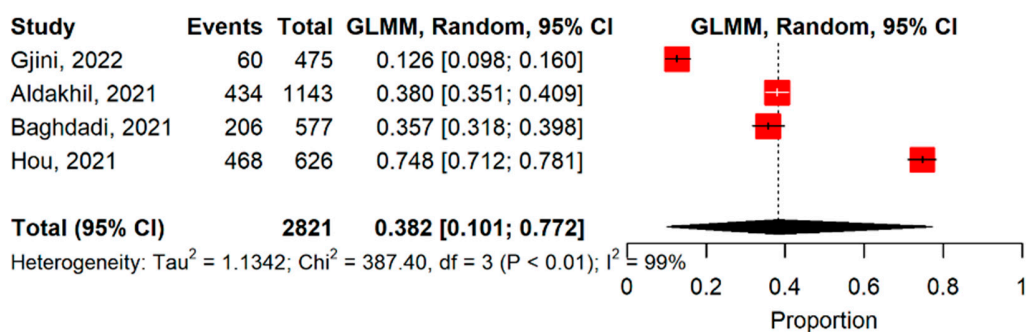
Figure S1. Funnel plots for assessing the publication bias of reported the prevalence of willingness and hesitancy towards vaccination among the included studies. (a. prevalence of hesitancy towards childhood/routine vaccination; b. prevalence of willingness towards childhood/routine vaccination; c. prevalence of childhood/routine delayed vaccination; d. prevalence of willingness towards seasonal influenza vaccination).



a.



b.



c.

Figure S2. Forest Plot. Pooled prevalence towards childhood/routine vaccination. (a. prevalence of hesitancy towards childhood/routine vaccination; b. prevalence of willingness towards childhood/routine vaccination; c. prevalence of childhood/routine delayed vaccination).

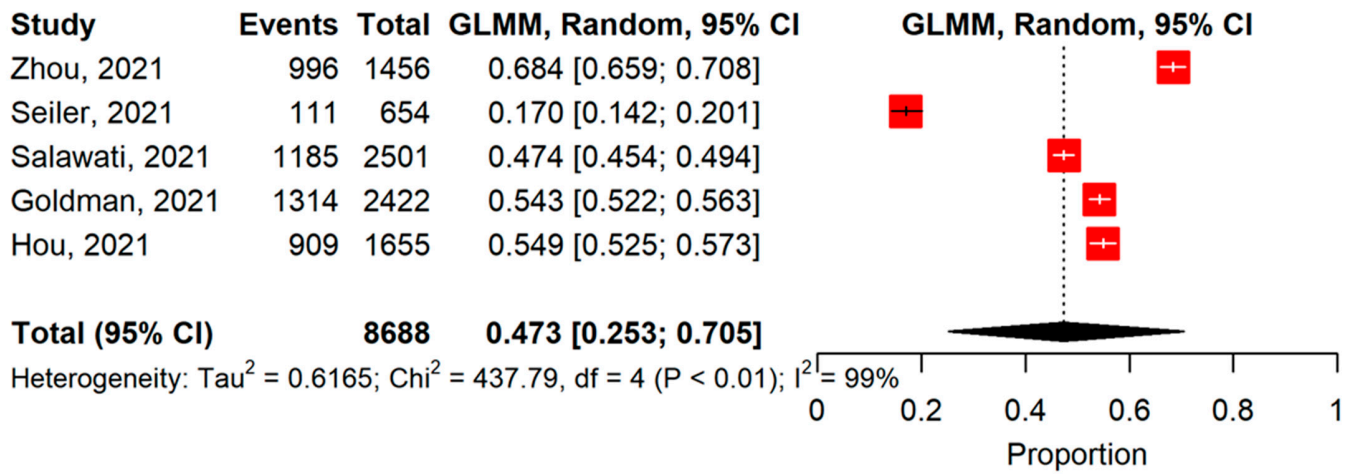


Figure S3. Forest Plot. Pooled prevalence of willingness towards seasonal influenza vaccination.